Case 3061

Hemibagrus Bleeker, 1862 (Osteichthyes, Siluriformes): proposed stability of nomenclature by the designation of a single neotype for both *Bagrus nemurus* Valenciennes, 1840 and *B. sieboldii* Bleeker, 1846, and the designation of the lectotype of *B. planiceps* Valenciennes, 1840 as the neotype of *B. flavus* Bleeker, 1846

H.H. Ng, Y.Y. Goh and P.K.L. Ng

School of Biological Sciences, National University of Singapore, 10 Kent Ridge Crescent, Singapore 119260, Republic of Singapore
(e-mail: scip7116@leonis.nus.edu.sg)

Julian Dodson

Département de Biologie, Pavillion Alexandre-Vachon, Cité Universitaire, Québec, Canada G1K 7P4

Abstract. The purpose of this application is to stabilise the taxonomy of two species-groups within the catfish genus *Hemibagrus* Bleeker, 1862. The uncertain status of two supposed junior synonyms, *Bagrus flavus* Bleeker, 1846 and *B. sieboldii* Bleeker, 1846, is resolved by making them respectively objective junior synonyms of *B. planiceps* Valenciennes, 1840 and *B. nemurus* Valenciennes, 1840.

Keywords. Nomenclature; taxonomy; Osteichthyes; Siluriformes; catfish; BAGRIDAE; *Hemibagrus*; *Hemibagrus flavus*; *Hemibagrus nemurus*; *Hemibagrus planiceps*; *Hemibagrus sieboldii*.

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1. The nominal genus *Hemibagrus* was established by Bleeker (1862, p. 9) with *Bagrus nemurus* Valenciennes in Cuvier & Valenciennes, 1840 (p. 423) as the type species by original designation. Bagrid catfishes of *Hemibagrus* are economically important in South, East and Southeast Asia. Their taxonomy is confusing and a number of nominal species exist for which types, even if they exist, cannot be identified with certainty. We and our colleagues have been investigating the biology of members of *Hemibagrus* in recent years, with various ongoing studies focusing on their systematics, zoogeography and phylogeny, using both morphological and genetic characters (Kottelat & Lim, 1995; Ng & Ng, 1995; Dodson, Colombani & Ng, 1995). Many of the larger species are also being investigated for use in aquaculture. Our studies are complicated by the probable synonymy of two pairs of nominal taxa:

Bagrus flavus Bleeker, 1846 as the junior synonym of *B. planiceps* Valenciennes in Cuvier & Valenciennes, 1840;

Bagrus sieboldii Bleeker, 1846 as the junior synonym of *B. nemurus* Valenciennes in Cuvier & Valenciennes, 1840.

Each pair of synonyms is considered in turn and a course of action proposed to resolve the problem.

Bagrus planiceps* / *Bagrus flavus

2. *Bagrus planiceps* Valenciennes in Cuvier & Valenciennes, 1840 (p. 421), *B. anisurus* Valenciennes in Cuvier & Valenciennes, 1840 (p. 423) and *B. flavus* Bleeker, 1846 (p. 156) are three of the nominal species in the *H. planiceps* species-group as defined by Ng & Ng (1995). *Bagrus planiceps* was described from two specimens measuring 4 and 8 French inches (= 108 and 216 mm respectively) in total length, collected by Heinrich Kuhl and Johan Coenraad van Hasselt from Java. *Bagrus anisurus* was described from a single specimen, also collected by Kuhl and van Hasselt from Java, measuring 14 French inches (= 379 mm) in total length. *Bagrus flavus* was described from an unspecified number of specimens of unstated size from somewhere in Java. *Bagrus planiceps* had been placed in the genus *Mystus* Scopoli, 1777 by some workers, but is currently classified in the genus *Hemibagrus* (see Mo, 1991).

3. Bleeker (1858, pp. 154–155), acting as first reviser, synonymised *B. anisurus* and *B. flavus* under *B. planiceps*; the two junior nominal taxa have not been accepted as valid species since then. Roberts (1993), who reviewed the ichthyological contributions of Kuhl and van Hasselt, followed this synonymy and stated that their specimens were currently deposited in the Muséum National d'Histoire Naturelle (MNHN) in Paris and the Nationaal Natuurhistorisch Museum (NNM) in Leiden. He reported that he had examined the 'holotype' of *B. planiceps* in the MNHN as well as the holotype of *B. anisurus* in the NNM (Roberts, 1993, p. 30).

4. In the NNM, there are seven specimens collected by Kuhl and van Hasselt from Java (NNM 2939, 2941, 2956–2959, 2962) which are labelled as *B. planiceps*; all are kept in separate bottles. Of these, one specimen (NNM 2956) has a label which states 'Holotype (?) *Bagrus anisurus*'. There is also one Kuhl and van Hasselt specimen in the MNHN from Java labelled as *B. planiceps* (MNHN B.615). As far as is known, these are the only known specimens of *B. planiceps* or *B. anisurus* collected by Kuhl and van Hasselt. Roberts (1993, p. 30) had identified a specimen 102 mm standard length and 121 mm total length (MNHN B.615) as the holotype of *B. planiceps*, but this is incorrect; as noted in para. 2 (above), *B. planiceps* was described from two specimens measuring 108 and 216 mm in total length. The two specimens of *B. planiceps* reported by Valenciennes are thus syntypes. Roberts noted that one of the specimens of *B. planiceps* used by Valenciennes in his description had been drawn but the figure had never been published. Roberts (fig. 65) published this illustration, noting that the figure of the specimen measured 136 mm in total length and that this was three-fifths of the natural size. The specimen illustrated would measure about 227 mm total length in life. This would thus agree fairly closely with the measurement provided by Valenciennes for the larger specimen of *B. planiceps* (216 mm, total length). We have examined the MNHN specimen which Roberts incorrectly regarded as the holotype of *B. planiceps*, which measures 121 mm in total length. As such, it does not match either of the two specimens used by Valenciennes for his description of *B. planiceps* and cannot be regarded as a syntype of the species. Of the seven Kuhl and van Hasselt specimens of *B. planiceps* in the NNM, the second largest specimen (NNM 2939; 212 mm total length, 179 mm standard length) agrees very well with the length of the larger of the two syntypes of *B. planiceps* (216 mm total length) and we are confident that it is that specimen. The largest NNM specimen of *B. planiceps* is the one which also carries a label noting that it might be the type of *B. anisurus*. This

specimen (NNM 2956) measures 377 mm in total length (283 mm standard length), and compares very well with the only specimen (total length 379 mm) mentioned by Valeciennes (in Cuvier & Valenciennes, 1840, p. 423) in his description of *B. anisurus*. Although we do not know who placed the query on the label, because the length of NNM 2956 agrees so well with the size given by Valenciennes we are confident that it is the holotype of *B. anisurus*. The other five specimens of *B. planiceps* are all much smaller and none comes close to the sizes mentioned by Valenciennes for *B. planiceps* or *B. anisurus*.

5. The problem associated with the types of *Bagrus flavus* is altogether more complex. Bleeker (1846) described *B. flavus* while stationed in Batavia (now Jakarta), but he was shortly afterwards transferred to Samarang. During this transfer, Bleeker (1878, p. 21) stated that 'it was out of the question to move my collections to my new station, so I had to leave them behind in Batavia'. Boeseman (1973, p. 59) noted that 'when Bleeker returned from the East Indies [in 1860], he still had in his possession all the original specimens, excepting a few that had already been lost in the East Indies during the period of his banishment from Batavia'.

6. There is a series of Bleeker specimens in the NNM labelled as *B. planiceps*, which may or may not include the type material of *B. flavus*. The problems with Bleeker's material are well known. Bleeker often placed specimens of what he considered one species (including types) together in the same bottle without any data or explanation, even if they were from different localities. In 1862, Bleeker (p. 56) noted that he had 21 specimens of *B. planiceps* ranging from 130–335 mm in total length from eight localities in Java and Sumatra. As he had synonymised *B. anisurus* and *B. flavus* with *B. planiceps*, all his specimens in the NNM would have been labelled as *B. planiceps*, and if he had any type material of *B. flavus*, he would almost certainly have mixed them with the non-types as well. To sort out Bleeker's specimens of *B. flavus* is made more difficult by the fact that he did not state the number or size of his specimens when describing *B. flavus* from Java (Bleeker, 1846, p. 156). We examined 23 Bleeker specimens in the NNM labelled as *B. planiceps* (NNM 6865, 22 specimens, 59–234 mm standard length; NNM 12039, one specimen, 129.4 mm standard length), all without any data. As Bleeker in 1862 had only 21 specimens, at least two of the present series must have been collected after that date. Bleeker had also distributed some of his specimens to the Natural History Museum (NHM) in London, and Günther (1864, p. 81) lists in his catalogue one specimen of *Bagrus planiceps* 'from Dr. P. v. Bleeker's Collection'. As the material was sent to the NHM after the publication in 1862 of vol. 2 of Bleeker's atlas (see Hubrecht, 1879), the above remarks apply to this specimen as well, and there is no way of knowing if it is actually a type. The same applies to any of Bleeker's specimens in other museums to which they were distributed after his death (see Boeseman, 1973, p. 60).

7. According to Fricke (1991, p. 8), one syntype of *B. flavus* is deposited in the Staatliches Museum für Naturkunde (SMNS) in Stuttgart (SMNS 10570, 99.8 mm standard length), but we are unable to ascertain if it is a type. This is unlikely to be the case, as Bleeker donated the specimen to SMNS in 1860, and it was probably obtained after his transfer to Samarang and formed part of the mixed series currently in NNM and NHM. The generally poor degree of preservation of the NNM and NHM specimens (twisted bodies, considerable degree of shrinkage and faded coloration) makes their identification difficult. However, eight NNM specimens were

radiographed, and two groups of vertebral counts were discerned. One group had 47–49 vertebrae, whereas the second had 50–52 vertebrae. Of the seven Kuhl and van Hasselt specimens of *B. planiceps* and *B. anisurus* radiographed, all have 47–49 vertebrae. We radiographed five fresh specimens of *B. planiceps* recently collected from Java, all of which have 47–49 vertebrae. We have also radiographed 15 specimens of what had been identified as *B. planiceps* from various parts of Sumatra (fresh, as well as post-Bleeker material with definite locality data). All have 50–52 vertebrae. We believe these Sumatran specimens represent an undescribed species in the *B. planiceps* species-group.

8. Whether any of the NNM specimens are the types of *B. flavus* can never be established for certain. This uncertainty, compounded by the poor condition of the specimens and the fact that Bleeker had specimens of *B. flavus* and *B. planiceps* from Java and Sumatra mixed together, makes it impracticable to select a lectotype from this series.

9. Recent collections from west Java have provided fresh specimens of an elongate *Hemibagrus* with 47–49 vertebrae, rounded caudal fin lobes with the principal ray on the upper lobe produced into a long filament, and yellowish live coloration, which are all clearly referable to *H. planiceps*. Their yellowish coloration in life also supports the contention that *B. flavus* is a synonym of *H. planiceps*. No other members of the *Hemibagrus planiceps* species-group have been collected from Java. The only other *Hemibagrus* species we have obtained from Java is *H. nemurus*, which is easily distinguished by its shorter body with 43–45 vertebrae and generally more greyish live coloration. Although Bleeker regarded *B. planiceps*, *B. anisurus* and *B. flavus* as synonyms, the absence of a type for *B. flavus* poses problems in studying the other species from Southeast Asia. Ng & Ng (1995) have shown that the *Hemibagrus planiceps* species-group is more speciose than previously believed, with new or poorly-known taxa present in other parts of Southeast Asia. It is possible that one of these taxa, particularly specimens with a yellowish live color, may be attributed to *B. flavus*. Java is already heavily developed and some species originally described from there can no longer be found on the island (Whitten, Soeriaatmadja & Afiff, 1996, pp. 718–720). We cannot discount the possibility that more than one species of *Hemibagrus* belonging to the *H. planiceps* species-group may have existed on Java during Bleeker's time. The absence of a type for *B. flavus* seriously complicates our revision of this species-group, as there is a need to establish positively the identity of *B. flavus* Bleeker, 1846, and its supposed synonymy with *B. planiceps*. Therefore, in the interest of clarifying the identity and maintaining the synonymy of *B. flavus* with *B. planiceps*, the designation of a neotype for *B. flavus* is necessary. Similar problems with the types of *Hemibagrus hoevenii* (Bleeker, 1846) have been discussed by Kottelat, Lim & Ng (1994) and a neotype for this species was designated by the Commission (Opinion 1840, June 1996).

10. Since the type series of *B. flavus* can never be recognized with certainty, and therefore the nominal species cannot be identified, we propose that the synonymy with *B. planiceps* be made objective by designating a lectotype of *B. planiceps* as the neotype of *B. flavus*. We recognize that an alternative proposal could have been to ask the Commission to suppress the nominal species *B. flavus* for the purposes of the Principle of Priority but not for those of the Principle of Homonymy; however, we consider that the action we propose is more in keeping with the situation. We hereby

designate as the lectotype of *B. planiceps* specimen no. NNM 2939 in the Nationaal Natuurhistorisch Museum, Leiden, referred to in para. 4 (above), and propose that this specimen should also be designated as the neotype of *B. flavus* (see para. 19(1)(a) below).

Bagrus nemurus* / *Bagrus sieboldii

11. *Bagrus nemurus* Valenciennes in Cuvier & Valenciennes, 1840 (p. 423) and *Bagrus sieboldii* Bleeker, 1846 (p. 155) are two of the nominal species in the *H. nemurus* species-group (Ng & Ng, 1995). Valenciennes described *B. nemurus* solely from a specimen measuring 15 French inches (=406 mm) in total length collected by Kuhl and van Hasselt from Java. Roberts (1993, p. 30) noted that one of the specimens of *B. nemurus* examined by Valenciennes had an unpublished figure prepared for the original description. He published this illustration (fig. 63) and noted that the figure of the specimen measured 144 mm in total length. He indicated that this was one-third of the natural size, making the actual specimen illustrated about 432 mm in total length. This is too long compared to the measurement provided by Valenciennes (406 mm total length) and thus cannot be a holotype (see also para. 12 below). *Bagrus nemurus* has been placed in the genus *Mystus* by some workers, but is currently classified in the genus *Hemibagrus* (see Mo, 1991), for which it is the type species (see para. 1 above). Bleeker described *Bagrus sieboldii* from an unspecified number of specimens of unstated size from somewhere in Java (see also paras. 2 and 5 above).

12. The Javanese material collected by Kuhl and van Hasselt is deposited both in the Nationaal Natuurhistorisch Museum in Leiden (NNM) and the Muséum National d'Histoire Naturelle in Paris (MNHN). Roberts (1993, p. 28) remarked that the holotype of *B. nemurus* 'should be in Leiden'. There is no specimen referable to *B. nemurus* collected by Kuhl and van Hasselt from Java deposited in the MNHN, nor is there any evidence that such specimens have ever been deposited there. In the NNM, the only specimen referable to *B. nemurus* collected by Kuhl and van Hasselt is a skeleton (catalogue no. NNM 269) of only 175 mm standard length. This specimen, bearing the unpublished name '*Bagrus tetragonocephalus* van Hasselt' is in poor condition with the vertebral column showing evidence of being repaired (Roberts, 1993; pers. obs.).

13. Ongoing studies by ourselves and our colleagues have shown that what is now known as *H. nemurus* actually consists of a complex of several species which are morphologically very similar (Ng & Ng, 1995). Many characters at present used to differentiate the species within the group are non-osteological and it is not possible to differentiate taxa on the basis of skeletal morphology alone. In the absence of a holotype, one possible action would be to designate as the neotype the skeleton of the specimen collected by Kuhl and van Hasselt from Java. This, however, is not advisable since it is impossible to discern key characters such as body form, morphology of the soft parts and color from the skeleton.

14. Bleeker (1858, p. 151) synonymised his own species, *B. sieboldii*, under *B. nemurus* Valenciennes; the junior synonym has not been accepted as valid since then. Bleeker (1862, p. 55) subsequently noted that he had 32 specimens of *B. nemurus* ranging from 105–340 mm in total length from 18 localities in Java, Sumatra, Banka and Borneo. As he had synonymised *B. sieboldii* with *B. nemurus*, all Bleeker's

specimens in the NNM would have been labelled as *B. nemurus*, and if he had any type material of *B. sieboldii* he would have mixed it with the non-types. To sort out Bleeker's specimens of *B. sieboldii* is made even more difficult by the fact that Bleeker did not state the number or size of his specimens when describing *B. sieboldii* from Java.

15. There is a series of Bleeker's specimens in the NNM labelled as *B. nemurus*, which may or may not include the types of *B. sieboldii*. We examined 19 specimens (NNM 6863, 48.5–256 mm standard length) all without any data. As the smallest specimen reported by Bleeker (1862, p. 55) is 105 mm total length and the smallest we have seen is 57.0 mm total length (48.5 mm standard length), some of the present series must have been collected after 1862. These specimens seem to belong to more than one species, but the twisted bodies, considerable degree of shrinkage, faded coloration and generally poor degree of preservation make identification difficult. According to Fricke (1991, p. 8), one syntype of *B. sieboldii* is deposited in the Staatliches Museum für Naturkunde in Stuttgart (SMNS 10572, 123.8 mm standard length). As with *B. flavus* (para. 7 above), this is unlikely to be the case. It is not possible to establish for certain whether any of the NNM or SMNS specimens are the types of *B. sieboldii*. Thus, it is impractical to select a lectotype from this series due to this uncertainty, compounded by the poor condition of the specimens and the fact that Bleeker had specimens of *B. nemurus* and *B. sieboldii* from Java, Sumatra, Banka and Borneo. It is just as likely that the original type material of *B. sieboldii* is lost. Günther's (1864, p. 81) catalogue lists specimens of *Bagrus nemurus* in the NHM 'from Dr. P. v. Bleeker's Collection'. The material was sent to the NHM after the publication in 1862 of vol. 2 of Bleeker's atlas (Hubrecht, 1879); there is no way of knowing if it or Bleeker's specimens in other museums are actually type specimens.

16. We have examined a *Hemibagrus* with 43–45 vertebrae, a thin dark midaxial streak, and a faint humeral spot during recent collections in Java; these specimens are referable to *H. nemurus*. The only other species we have encountered on Java is *H. planiceps*, which is easily distinguished by its longer body with 47–49 vertebrae and generally more yellowish live coloration.

17. Although Bleeker (1858, p. 151) synonymised *B. sieboldii* with *B. nemurus*, the absence of a type for *B. sieboldii* poses problems in studying the other species from Southeast Asia. Ng & Ng (1995) showed that the *Hemibagrus nemurus* species-group is more speciose than previously believed, with new or poorly-known taxa present in other parts of Southeast Asia. A remote possibility exists that one such taxon may be conspecific with *B. sieboldii*. As pointed out in para. 9 (above) some species originally described from Java are no longer found there as the island has been heavily developed. We cannot exclude the possibility of more than one species of *Hemibagrus* belonging to the *H. nemurus* species-group having existed in Java in the last century. Our revision of this species-group is seriously complicated by the absence of types for *B. nemurus* and *B. sieboldii*, and there is a need to establish positively the identity of *B. nemurus* Valenciennes and *B. sieboldii* Bleeker. The necessity to fix the identity of *B. nemurus* is also made more important by the fact that it is the type species of the genus *Hemibagrus* Bleeker. Therefore, the designation of a neotype is necessary in the interests of clarifying the identity and maintaining the synonymy of *B. sieboldii* and *B. nemurus*.

18. Since the type series of *B. sieboldii* can never be recognized with certainty, and thus the nominal species cannot be identified, we propose that the synonymy with *B. nemurus* be made objective by the designation as the neotype of both nominal species of specimen no. ZRC 41504 in the Zoological Reference Collection, National University of Singapore, collected from Sungai Sokan at Cibalagung, a probable outlet of the Cirata Reservoir at Citarum by Y.Y. Goh and D. Wowor on 21 June 1997. This specimen is in accord with the accepted meaning of the name *Hemibagrus nemurus* and, unlike the Kuhl and van Hasselt material, is in good condition.

19. The International Commission on Zoological Nomenclature is accordingly asked:

(1) to use its plenary powers to set aside all previous fixations of type specimens for the following nominal species and to designate as the respective neotypes the specimens indicated:
   (a) *Bagrus flavus* Bleeker, 1846: specimen no. NNM 2939 in the Nationaal Natuurhistorisch Museum, Leiden (the lectotype of *Bagrus planiceps* Valenciennes in Cuvier & Valenciennes, 1840);
   (b) *Bagrus nemurus* Valenciennes in Cuvier & Valenciennes, 1840: specimen no. ZRC 41504 in the Zoological Reference Collection, National University of Singapore;
   (c) *Bagrus sieboldii* Bleeker, 1846: specimen no. ZRC 41504 in the Zoological Reference Collection, National University of Singapore;

(2) to place on the Official List of Generic Names in Zoology the name *Hemibagrus* Bleeker, 1862 (gender: masculine), type species by original designation *Bagrus nemurus* Valenciennes in Cuvier & Valenciennes, 1840;

(3) to place on the Official List of Specific Names in Zoology the following names:
   (a) *planiceps* Valenciennes in Cuvier & Valenciennes, 1840, as published in the binomen *Bagrus planiceps* and as defined by the lectotype designated in para. 10 (above) by Ng, Goh, Ng & Dodson (1999);
   (b) *nemurus* Valenciennes in Cuvier & Valenciennes, 1840, as published in the binomen *Bagrus nemurus* and as defined by the neotype designated in (1)(b) above (specific name of the type species of *Hemibagrus* Bleeker, 1862);

(4) to place on the Official Index of Rejected and Invalid Specific Names in Zoology the following names:
   (a) *flavus* Bleeker, 1846, as published in the binomen *Bagrus flavus* (a junior objective synonym of *B. planiceps* Valenciennes in Cuvier & Valenciennes, 1840);
   (b) *sieboldii* Bleeker, 1846 as published in the binomen *Bagrus sieboldii* (a junior objective synonym of *B. nemurus* Valenciennes in Cuvier & Valenciennes, 1840).

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Comments on this case are invited for publication (subject to editing) in the *Bulletin*; they should be sent to the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).